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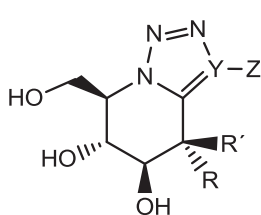
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Intramolecular [3+2] Cycloaddition of Fused Azolo-Azepanes from Azido Monosaccharide Derivatives

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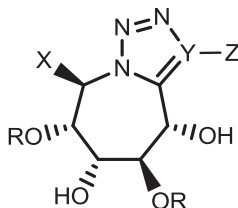
Bicyclic aromatic compounds have shown an enhanced potency as inhibitors and therefore a number of tetrazoles, triazoles and imidazoles, fused to pyranoses and furanoses have been synthesized.^[1] The glucotetrazole **2** was designed as a bicyclic neutral transition state analogue inhibitor of β -glucosidases and glycogen phosphorylase. The mannose analogue **3** is an inhibitor of mannosidases and the glucotriazole **4** is a competitive inhibitor of glycogen phosphorylase. In previous experiences, we have synthesized polyhydroxyazepane derivatives with amide, aminomethyl or hydroxymethyl groups, starting from epoxyamides.^[2] Now, with the aim of obtaining new inhibitors, we are interested in the formation of bicyclic compounds with azepanes fused to azoles (**5,6,7**). Azoles are profusely found in bioactive products but few tetrazoles^[3] and triazoles fused to polyhydroxyazepanes have been reported to be evaluated as inhibitors.



2: R=OH, R'=H, Y=C, Z=CO₂H

3: R=H, R'=OH, Y=N, Z=

4: R=OH, R'=H, Y=N, Z=



5: X=H, Y=C, Z=CO₂Et

6: X=H, Y=N, Z=

7: X=CH₂OH, Y=N, Z=



The methodology carried out to form the heterocyclic ring is based on intramolecular [3+2] cycloaddition of azido monosaccharide derivatives containing ciano or other unsaturated groups.

In order to elucidate the mechanism of formation of the bicyclic products, a quantum chemical topological study has been carried out.

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References

- [1] Tailford, L. E.; Offen, W.; Smith, N. L.; Dumon, C.; Morland, C.; Gratien, J.; Heck, M-P.; Stick, R. V.; Blériot, Y.; Vasella, A.; Gilbert, H. J.; Davies, G. J. *Nat. Chem. Biol.* **2008**, *4*, 306.
- [2] Oña, N.; Romero-Carrasco, A.; Pino-González, M. S. *Tetrahedron: Asymmetry* **2013**, *24*, 156 and references therein.
- [3] Paz, N. R.; Santana, A. G.; Francisco, C. G.; Suárez, E.; González, C. C. *Org. Lett.* **2012**, *14*, 3388.

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